CREE RESEARCH • INC

The Leader in Silicon Carbide Solid State Technology

Silicon Carbide Blue LEDs
T-1, T-1 3/4

5D36
109457

Features

- Low Cost
- High Performance - 24µW
- 466nm peak wavelength
- Industry Standard Packages
- Proven Reliability
- Medical Instruments

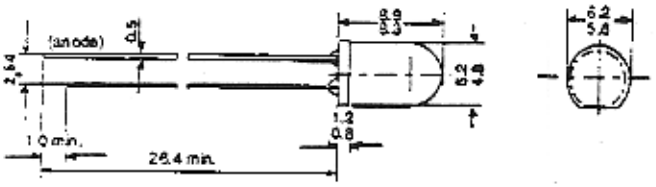
Applications

- Full Color Displays & Moving Message Signs
- Front Panel Indicators
- Color Printers and Scanners
- Legend and Switch Backlighting
- Circuit Board Status Indicators

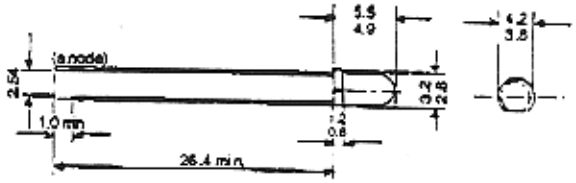
Description

Cree's C470 series silicon carbide blue LEDs have a typical power output of 24µW (at 20mA) and a peak wavelength of 466nm. The LEDs are available in T-1 3/4 and T-1 packages with either clear, diffused or tinted diffused epoxy. These industry standard packages are ideally suited for adding the "high tech" look of blue to almost any indicator application which uses standard red or green LEDs.

T-1 3/4 Mechanical Specification (in mm)



T-1 Mechanical Specification (in mm)



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Typical Characteristics at If = 20mA

	C470-5C18	C470-5D18	C470-5T18	C470-3C18	C470-3D18	C470-3T18
Package	T-1 3/4	T-1 3/4	T-1 3/4	T-1	T-1	T-1
Lens	Water Clear	White Diffused	Tinted Diffused	Water Clear	White Diffused	Tinted Diffused
Viewing Angle	16°	34°	20°	24°	42°	30°
Forward Voltage	3.4V	3.4V	3.4V	3.4V	3.4V	3.4V
Radiant Flux	24µW	24µW	24µW	24µW	24µW	24µW
Luminous Intensity	16 mcd	4 mcd	5 mcd	7 mcd	3 mcd	4 mcd
Peak Wavelength	466nm	466nm	466nm	466nm	466nm	466nm
Dominant Wavelength	481nm	481nm	481nm	481nm	481nm	481nm

Maximum Ratings at T_A = 25°C

	T-1	T-1 3/4
DC Forward Current [Note 1]	30mA	40mA
Peak Forward Current (1/10 duty cycle @ 1kHz) [Note 1]	150mA	150mA
Reverse Current (Vf = 5V)	10µA	10µA
LED Junction Temperature [Note 2]	125°C	125°C
Reverse Voltage	5V	5V
Operating Temperature Range	-40°C to +85°C	-40°C to +85°C
Storage Temperature Range	-40°C to +85°C	-40°C to +85°C
Power Dissipation	125mW	125mW

Notes:

1. Maximum ratings are package dependent. The forward currents (dc and Peak) are not limited by the silicon carbide die, but by the LED junction temperature and its affect on the package. Please refer to Figures 6 and 9 for specific derating curves.
2. The junction temperature limit of 125°C is not a limit of the silicon carbide die, but a limit of the T-1 and T-1 3/4 packages used for characterization. Junction temperature should be characterized in specific packages to determine limitations. In general the junction temperature is a function of the lead frame material. Although the die has been proven to reliably emit blue light at 350° when brazed to a header (the intensity is greatly reduced at these temperatures), most standard clear potting epoxies will lose clarity when operated at temperatures above 125°C. Cree only guarantees the above maximum ratings.

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Fig. 1. Forward Current vs. Forward Voltage

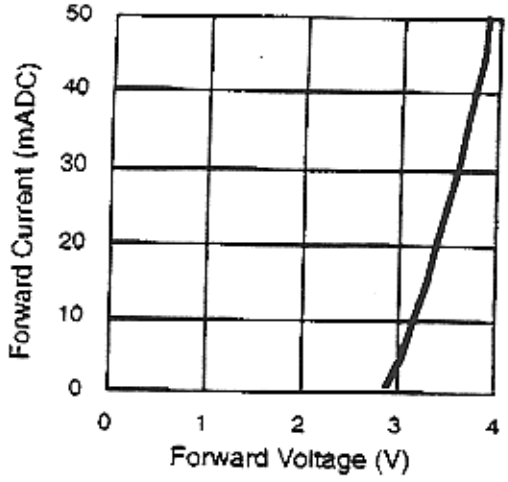


Fig. 2. Relative Intensity vs. Wavelength

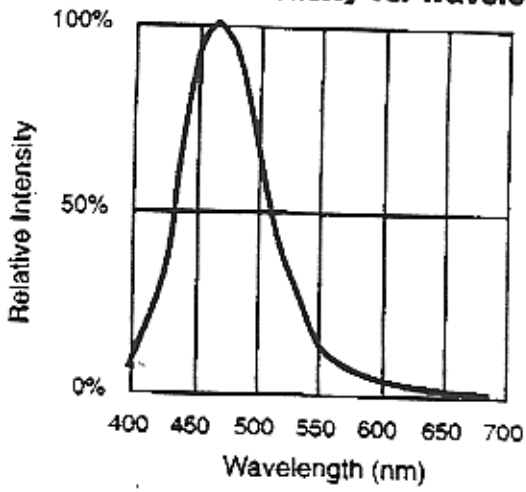


Fig. 3. Dominant Wavelength vs. Forward Current

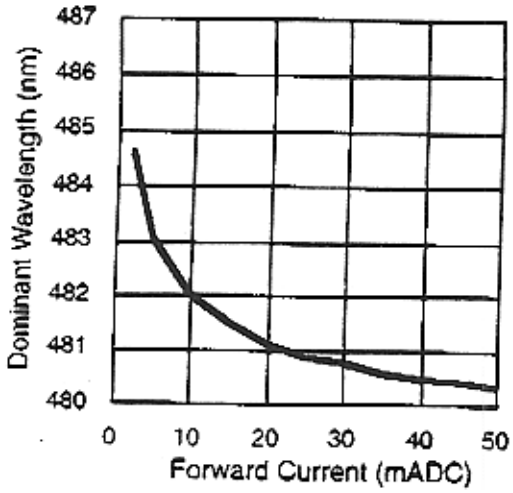


Fig. 4. Relative Intensity vs. Forward Current

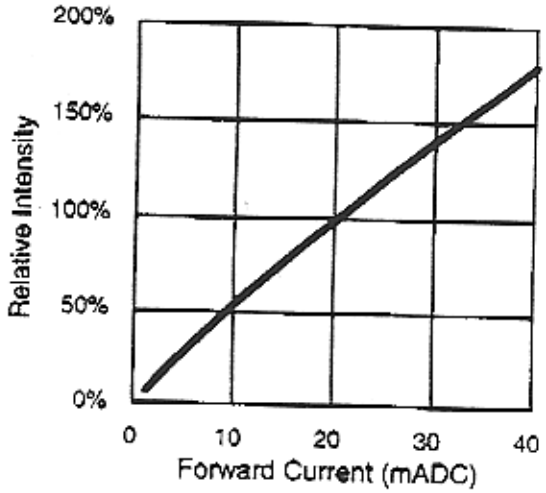


Fig. 5. Relative Intensity vs. Lead Temperature

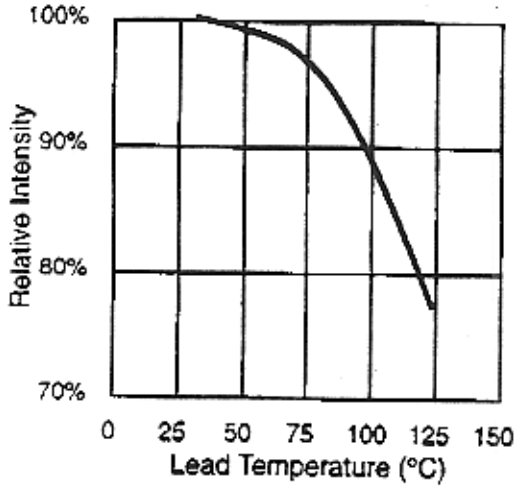
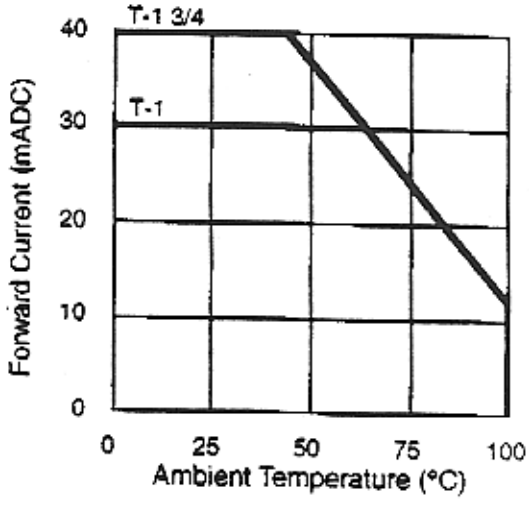


Fig. 6. Forward Current vs. Ambient Temperature



MAY-11-95 15:31 FROM: ID: PAGE 4/5

Silicon Carbide Blue LEDs
T-1, T-1 3/4

Fig. 7. Peak Forward Current vs. Forward Voltage (100 µs test pulse; 1% duty cycle)

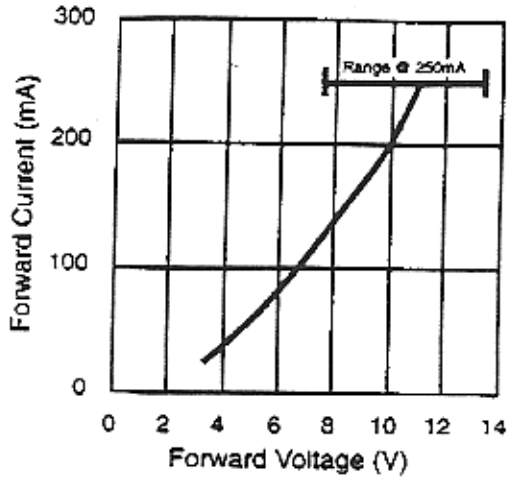


Fig. 8. Relative Intensity vs. Peak Forward Current (350 µs pulse width; 10 ms period)

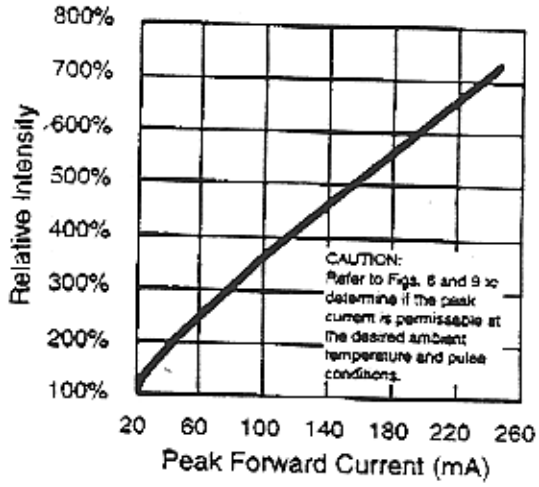


Fig. 9. Pulse Derating Curve

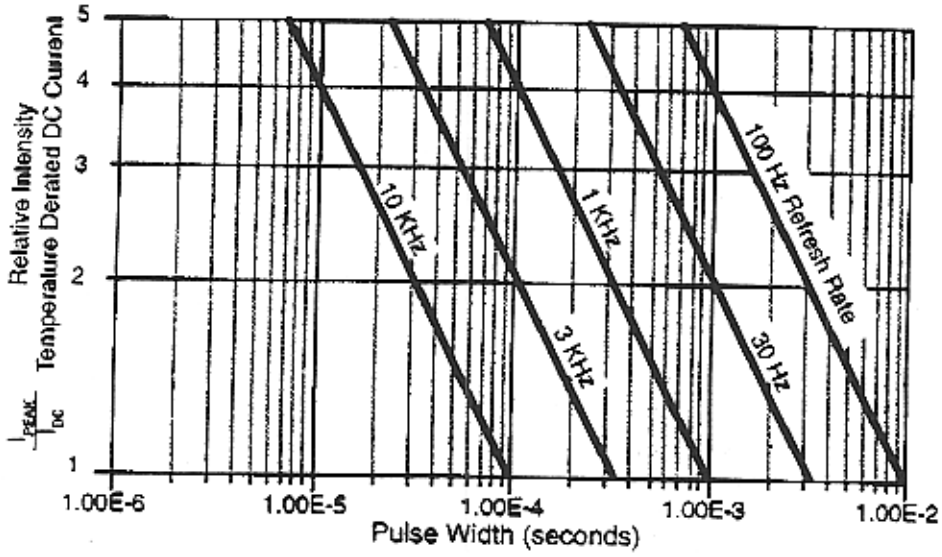


Fig. 10.Typical Radiation Pattern